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**STATUS OF CLAIMS:**

Claims 8-11 and 13-40 are pending herein, claim 12 having been cancelled above without prejudice or disclaimer. Claims 1-7 were previously cancelled without prejudice or disclaimer.

Support for the amendment of claims 8, 17, 27 and 30 can be found, for example, in cancelled claim 12. Hence, no new matter is added.

**REMARKS**

**A. Rejection of Claims 8-13, 15-21 and 27-29 under 35 U.S.C. 103(a)**

Claims 8-13, 15-21 and 27-29 are rejected under 35 U.S.C. 103(a) as unpatentable over Huang (U.S. Patent No. 6,171,940) and Hasegawa (U.S. Patent No. 6,452,274). Applicants respectfully traverse this rejection and its supporting remarks.

For example, presently pending independent claims 8, 17, 27 and 30 each requires a mask structure that contains a CVD organic layer that comprises carbon and hydrogen. The CVD organic layer is deposited over a substrate structure by a plasma enhanced chemical vapor deposition process using a feed stream that comprises a hydrocarbon species.

Such a mask structure is neither disclosed nor suggested by Huang, which merely refers to an "organic material layer having low dielectric constant" which is used for a purpose "analogous to that of a hard mask." See, e.g., col. 1, lines 49-51.

Recognizing this, the Office turns to Hasegawa, alleging that: "Hasegawa describes a method for forming an organic low dielectric layer by PECVD and using materials such as fluorinated ethylene propylene. This would form an organic layer comprising carbon and hydrogen....It would have been obvious for one skill in the art to form the organic low dielectric layer in light of Hasegawa because Hasegawa further teaches [a] method that is silent in Huang to form an organic low dielectric layer with a reasonable expectation of success." Applicants respectfully disagree.

For example, it is noted that the dielectric layers in Hasegawa are not *masking* layers for use in processing a substrate structure, but rather are *interlayer insulting layers* which are used in a multilayer interconnect structure of a finished device. See, e.g., Hasegawa Abstract and col. 1, lines 7-12. Hence, the layers of Huang and Hasegawa are employed in capacities that are completely unrelated to one another.

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In order to establish a *prima facie* case of obviousness under 35 U.S.C. 103, (a) there must be some suggestion or motivation to modify/combine the references of record, and (b) there must be a reasonable expectation of success. See MPEP §2143. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *Id.* The mere fact that references *can* be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination or modification. MPEP 2143.01 (emphasis added) (citing *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990)).

One skilled in the art would simply not be motivated to substitute an interlayer insulating material from a multilayer interconnect structure like that disclosed in Hasegawa into a masking structure like that of Huang.

Moreover, even assuming solely for the sake of argument that the substitution is made, there would not be any expectation of success. The fact that a material may be useful as an interlayer insulating material within a multilayer interconnect structure would by no means provide a reasonable expectation that the same material can be successfully employed as a masking layer.

In essence, the Office is suggested that it would be obvious to try the substitution of an interlayer insulating material from Hasegawa into the masking structure of Huang. However, even assuming for the sake of argument that such a substitution is obvious to try (and it is not), this does not represent a sufficient basis to reject the claims at issue. See *In re Tomlinson*, 363 F.2d 928, 931, 150 U.S. P.Q. 623, 626 (CCPA 1966) (permitting patentability determinations based on an "obvious to try" test "would not only be contrary to statute but result in marked deterioration of the entire patent system as an incentive to invest in those efforts and attempts which go by the name of 'research'"). In this connection, it is noted that "there is usually an element of 'obvious to try' in any research endeavor, that it is not undertaken with complete blindness but rather with some semblance of a chance of success." *Id.*

For at least the above reasons, it is respectfully submitted that independent claims 8, 17, 27 and 30 are each unobvious in view of Huang and Hasegawa.

Claims 9-11, 13, 15, 16, 18-21, 28 and 29 depend, either directly or indirectly from independent claims 8, 17 and 27 and are therefore patentable over Huang and Hasegawa for at least the same reasons. Claim 12 is cancelled.

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Accordingly, reconsideration and withdrawal of the rejection of claims 8-13, 15-21 and 27-29 under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa are respectfully requested.

**B. Rejection of Claims 22-24 under 35 U.S.C. 103(a)**

Claims 22-24 are rejected under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa and further in view of Tsai (U.S. Patent No. 6,083,815). Applicants respectfully traverse this rejection and its supporting remarks.

As noted above claim 17 is patentable over Huang and Hasegawa, at least in that (a) there is no teaching, suggestion or motivation to substitute an interlayer insulating material from the multilayer interconnect structure disclosed in Hasegawa into the masking structure disclosed in Huang, and (b) there would not be any expectation of success in making this substitution (e.g., the fact that a material may be useful as an interlayer insulating material within a multilayer interconnect structure would by no means provide a reasonable expectation that the same material can be successfully employed as a masking layer).

Tsai is cited by the Office Action for its alleged teachings regarding "etching a substrate to form a gate stack in which the doped polysilicon layer includes a native oxide and etching the native oxide and the doped polysilicon layer using 2 plasma etching processes that comprise halogen containing species to form a gate stack." These teachings do not make up for the above noted deficiencies in Huang and Hasegawa. For at least these reasons, it is respectfully submitted that independent claim 17 is patentable over Huang and Hasegawa in view of Tsai.

Claims 22-24 depend indirectly from independent claim 17 and are therefore patentable over Huang and Hasegawa in view of Tsai for at least the same reasons.

Accordingly, reconsideration and withdrawal of the rejection of claims 22-24 under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa in view of Tsai are respectfully requested.

**C. Rejection of Claims 25 and 26 under 35 U.S.C. 103(a)**

Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa and further in view of Lou (U.S. Patent No. 6,200,881). Applicants respectfully traverse this rejection and its supporting remarks.

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As noted above claim 17 is patentable over Huang and Hasegawa, at least in that (a) there is no teaching, suggestion or motivation to substitute an interlayer insulating material from the multilayer interconnect structure disclosed in Hasegawa into the masking structure disclosed in Huang, and (b) there would not be any expectation of success in making this substitution.

Lou is cited by the Office Action for its alleged teachings regarding "a method for etching a substrate which comprises a silicon layer, an oxide layer over the silicon layer, and a silicon nitride layer over the oxide layer, wherein the silicon, oxide and nitride layers are etched by one or more plasma etching steps comprising oxygen and halogen containing species." These teachings do not make up for the above noted deficiencies in Huang and Hasegawa. For at least these reasons, it is respectfully submitted that independent claim 17 is patentable over Huang and Hasegawa in view of Lou.

Claims 25 and 26 depend, either directly or indirectly from independent claim 17 and are therefore patentable over Huang and Hasegawa in view of Lou for at least the same reasons.

Accordingly, reconsideration and withdrawal of the rejection of claims 25 and 26 under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa in view of Lou are respectfully requested.

**D. Rejection of Claims 30, 31, 33 and 34 under 35 U.S.C. 103(a)**

Claims 30, 31, 33 and 34 are rejected under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa and further in view of Chapman (U.S. Patent No. 5,976,769). Applicants respectfully traverse this rejection and its supporting remarks.

As noted above claim 30 is patentable over Huang and Hasegawa, at least in that (a) there is no teaching, suggestion or motivation to substitute an interlayer insulating material from the multilayer interconnect structure disclosed in Hasegawa into the masking structure disclosed in Huang, and (b) there would not be any expectation of success in making this substitution.

Chapman is cited by the Office Action for its alleged teachings regarding "a method for providing sublithographic patterns wherein the exposed sidewalls of the organic layer are etched such that the width of the organic layer is reduced at the substrate using etching techniques including plasma etch." These teachings do not make up for the above noted deficiencies in Huang and Hasegawa. For at least these reasons, it is respectfully submitted that independent claim 30 is patentable over Huang and Hasegawa in view of Chapman.

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Claims 31, 33 and 34 depend, either directly or indirectly from independent claim 30 and are therefore patentable over Huang and Hasegawa in view of Chapman for at least the same reasons.

Accordingly, reconsideration and withdrawal of the rejection of claims 30, 31, 33 and 34 under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa in view of Chapman are respectfully requested.

**E. Rejection of Claims 14, 32 and 35-40 under 35 U.S.C. 103(a)**

Claims 14, 32 and 35-40 are rejected under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa, and further in view of Cheng (U.S. Patent No. 5,873,984) or as unpatentable over Huang, Hasegawa and Chapman, and further in view of Cheng. Applicants respectfully traverse these rejection and their supporting remarks.

For example, as noted above claims 8, 17, 27 and 30 are patentable over Huang, Hasegawa and Chapman, at least in that (a) there is no teaching, suggestion or motivation to substitute an interlayer insulating material from the multilayer interconnect structure disclosed in Hasegawa into the masking structure disclosed in Huang, and (b) there would not be any expectation of success in making this substitution.

Cheng et al. is cited by the Office Action for its alleged teachings regarding the carbon, carbon and nitrogen contain of an amorphous carbon layer. These teachings do not make up for the above noted deficiencies in Huang, Hasegawa and Chapman.<sup>1</sup> For at least these reasons, it is respectfully submitted that independent claims 8, 17, 27 and 30 are patentable over Huang, Hasegawa and Chapman in view of Cheng.

Claims 14, 32 and 35-40 depend, either directly or indirectly from independent claim 8, 17, 27 or 30 and are therefore patentable over Huang, Hasegawa and Chapman in view of Cheng for at least the same reasons.

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<sup>1</sup> In fact, Cheng describes the formation of an amorphous carbon overcoat as a protective film on a *magnetic recording disk*. See, e.g. Title and Abstract. Hence, Cheng has nothing to do with masking layers as presently claimed. In this regard, as noted in paragraph [0035], by providing carbon, hydrogen, and nitrogen contents within the claimed ranges one obtains, for example, (a) high polycrystalline-silicon:CVD-organic selectivity for etching purposes and (b) k and n values which allow it to cooperate with an overlying dielectric layer to give a multilayer hard mask structure with superior antireflective properties.

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Accordingly, reconsideration and withdrawal of the rejection of claims 14, 32 and 35-40 under 35 U.S.C. 103(a) as unpatentable over Huang and Hasegawa in view of Cheng, or over Huang, Hasegawa and Chapman in view of Cheng, are respectfully requested.

### CONCLUSION


Applicants submit that all pending claims of the present invention are in condition for allowance, early notification of which is earnestly solicited. Should the Examiner be of the view that an interview would expedite consideration of this Amendment or of the application at large, request is made that the Examiner telephone the Applicant's attorney at (703) 433-0510 in order that any outstanding issues be resolved.

### FEES

The Office is authorized to charge any fees due and owing in respect to this amendment to deposit account number 50-1047.

Attorney for Applicant  
Mayer Fortkort & Williams, PC  
251 North Avenue West, 2<sup>nd</sup> Floor  
Westfield, NJ 07090  
Tel.: 703-433-0510  
Fax: 703-433-2362

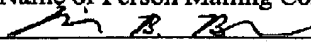
Respectfully submitted,

  
David B. Bonham  
Registration No. 34,297

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Patent Counsel, M/S 2061  
Legal Affairs Department  
Applied Materials, Inc.  
P.O. Box 450A  
Santa Clara, CA 95052

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